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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Bodo Furchheim

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EXAMINER

DIAZ, THOMAS C

ART UNIT

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3656

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/674,648	<b>Applicant(s)</b> FURCHHEIM ET AL.	
	<b>Examiner</b> THOMAS DIAZ	<b>Art Unit</b> 3656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07/24/2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 October 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status of Claims***

This office action is in response to the reply filed on 07/24/2008. The examiner appreciates and acknowledges applicant's response.

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "internal and/or external screw threads" from claim 1 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

2. Claims 1 and 4 objected to because of the following informalities:

Claim 1 recites "kneaded and/or upset **that same** are increased". The phrase is slightly grammatically confusing. It is recommended that perhaps replacing "that same" with "such that said regions which are clear of the cam regions" would clarify the phrase.

Claim 4 recites " characterized in that between the cams bearing faces are produced". The phrase is grammatically confusing. Perhaps adding "the area" between the words "that" and "between" would clarify the phrase.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki, U.S. Patent 4,660,269 in view of Jordan, U.S. Patent 4,382,390.**

Suzuki shows, in Figs. 1-12, a method for the manufacture of a camshaft from a tube 2, the camshaft having bearer rings 3 attached thereto, the method comprising the following steps; placing bearer rings, produced in a separate method and in correspondence with prospective locations of hollow cams on the cam shaft, in a high internal pressure forming tool 20, 21 together with the tube to be formed and subjected to the action of axial forces and a medium under high internal pressure, whereby the bearer rings are attached by expansion of the tube in a frictional and interlocking manner, each of the bearer rings having outer surface and an inner surface, the bearer rings having an even wall thickness (in a cross sectional view in the axial direction) and the necessary hardness, strength, and wear resistance; in a first method step prior to the high internal pressure forming, **regions (area near 7, 8)** which are clear of the regions in which the cams are seated are kneaded or upset that same are increased in thickness for forming **different functional elements 7 and 8 from the shaft itself**; characterized in that between the cam shaft ends in a step prior to internal high pressure forming bearing faces and the eventual region where the cams are to be seated, is produced by round kneading and by reducing the diameter in this part to the desired size; characterized in that between the cams bearing faces are produced by internal high pressure forming by expanding the tube; characterized in that the bearer rings are hardened in a known manner prior to being placed in the internal high pressure forming tool; characterized in that the ends of the tube comprise bearing faces, drive and/or control elements 4,5 and internal and/or external screw threads; characterized in that the bearer rings consist of sintered metal (col. 3, line 24);

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characterized in that at least one radially extending groove (the groove inherently formed in a hole with a hexagonal shape in cross section; see col. 3, lines 22-31 and ref. No. 14) is produced in the bearer ring and the drive and control elements; characterized by additional drive and control elements, preferably sprocket or gear wheels, secured by the internal high pressure forming method; characterized in that the side, facing the tube of the bearer ring has chamfers on both sides on the side facing the tube; and characterized in that the bearer rings are hardened prior to application on the formed cams; but fails to show the bearer rings having equal radial thickness completely around the tube where the cams are formed and the end regions of the tube being upset by kneading.

As to the matter of the bearer rings and the cams formed on the tube, Jordan teaches, in Figs. 1 and 2, a cam shaft, characterized in that the cam shaft is produced from a tube by the internal high pressure forming method comprising regions 7 of the tube defining hollow cams in form and in position in a single piece, and on the formed cams a bearer rings 2 shaped to correspond to the cam periphery and made of a hard, wear-resistant material is secured frictionally and in an interlocking manner, each of the bearer rings having an outer surface and an inner surface, the radial thickness between the outer and inner surface being equal completely around the cam.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the shape of the bearer ring of Suzuki with the equal radial thickness as taught by Jordan in order to reduce weight and cost as described by Jordan, in col. 1, lines 27-30 and 53-56.

As to the matter of the end regions being upset by kneading, The Examiner takes Official Notice the fact that a kneading process in metal forming art is well known practice. To change shape or size of any metal element by kneading would have been an obvious process choice.

**5. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki, U.S. Patent 4,660,269 in view of Dawson, IPN WO 88/00643.**

Suzuki shows, in Figs. 1-12, a method for the manufacture of a camshaft from a tube 2, the camshaft having bearer rings 3 attached thereto, the method comprising the following steps; placing bearer rings in correspondence with prospective locations of hollow cams on the cam shaft, the bearer rings having an even wall thickness (in a cross sectional view in the axial direction) and the necessary hardness, strength, and wear resistance, in a separate method; placing the tube and the bearer rings in a high internal pressure forming tool 20; applying axial forces to the ends of the tube while applying a medium under a high internal pressure to the tube, whereby the tube is expanded in defined regions to form the hollow cams from the material of the tube and whereby the bearer rings are attached to the hollow tube cams in a frictional and interlocking manner by expansion of the tube; **upsetting regions (area near 7 and 8)** which are clear of the regions in which the cams are seated so as to be stretched for forming different **functional elements 7 and 8 from the shaft itself**; characterized in that between the cam shaft ends in a step prior to internal high pressure forming bearing faces and the eventual region where the cams are to be seated, are produced by round kneading and by reducing the diameter in this part to the desired size;

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characterized in that between the cams bearing faces are produced by internal high pressure forming by expanding the tube; characterized in that the bearer rings are hardened in a known manner prior to being placed in the internal high pressure forming tool; characterized in that the ends of the tube comprise bearing faces, drive and/or control elements 4,5 and internal and/or external screw threads; characterized in that the bearer rings consist of sintered metal (col. 3, line 24); characterized in that at least one radially extending groove (the groove inherently formed in a hole with a hexagonal shape in cross section; see col. 3, lines 22-31 and ref. No. 14) is produced in the bearer ring and the drive and control elements; characterized by additional drive and control elements, preferably sprocket or gear wheels, secured by the internal high pressure forming method; characterized in that the side, facing the tube of the bearer ring has chamfers on both sides on the side facing the tube; and characterized in that the bearer rings are hardened prior to application on the formed cams; but fails to show the bearer rings having equal radial thickness completely around the tube where the cams are formed and the end regions of the tube being upset by kneading.

As to the matter of the bearer rings, Dawson shows, in Figs. 1-8, a cam shaft, characterized in that the cam shaft is produced from a tube 10 by the internal high pressure forming method comprising regions 24 of the tube defining hollow cams in form and in position in a single piece, and on the formed cams a bearer rings 12 shaped to correspond to the cam periphery and made of a hard, wear-resistant material is secured frictionally and in an interlocking manner, each of the bearer rings having an



outer surface and an inner surface, the radial thickness between the outer and inner surface being equal completely around the cam.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the shape of the bearer ring of Suzuki with the equal radial thickness as taught by Dawson in order to reduce weight and cost as described by Dawson, on page 13, lines 21-26.

As to the matter of the end regions being upset by kneading, The Examiner takes Official Notice the fact that a kneading process in metal forming art is well known practice. To change shape or size of any metal element by kneading would have been an obvious process choice.

### ***Response to Arguments***

6. In response to the applicant's argument that Suzuki fails to show the functional elements being formed from the shaft itself, Suzuki shows that the 7 and 8 are shaped to form different functional elements from the shaft itself, as recited in the claims.

Elements 7 and 8 provide a bearing surface for end caps 4 and 5 and are therefore different functional elements than the rest of the elements on the camshaft.

Applicant states that regions 7,8 "do not form any functional element, in particular no drive or control functional element". The "drive and/or control elements" as recited in claim 1 are different elements from the functional elements. Additionally, read in light of the specification, the different functional elements are defined as "(bearing seat, cam, etc)", see page 10 paragraph 36.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please note Swars (5868042) which also shows different functional elements 7 and 10 formed from the shaft itself. Also please note Harie (5040294) on the kneading process.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS DIAZ whose telephone number is (571)270-5461. The examiner can normally be reached on Monday-Friday 8:30am to 5:30pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571)272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Thomas Diaz/  
Examiner, Art Unit 3656

/Richard WL Ridley/  
Supervisory Patent Examiner, Art Unit 3656